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ABSTRACT

The report summarizes a conference on the state of British higher education which took place closely following publication of the Dearing Report (Summer 1997) on the role of colleges and universities in labor force and economic development. An introductory section gives an overview of enrollment trends, the funding system, public policy concerning the purposes of higher education, demands facing the universities, meeting industry needs, research in universities, and policy needs. The second section examines the role of scholarship in the universities, including the distinction between scholarship and research, and academic freedom and freedom of speech. The third section addresses the role of British higher education in the global education market, and section four its role as a national training agency. Research funding and policy are discussed in the fifth and sixth sections, and the universities' role in British competitiveness in the global commercial market in the seventh. The concluding section summarizes current challenges to the universities. A list of conference participants is included. (MSE)

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KING GEORGE VI & QUEEN ELIZABETH FOUNDATION OF ST CATHARINE'S

St Catharine's Conference Report No. 61

WHAT ARE UNIVERSITIES FOR?

A ST CATHARINE'S / GLAXO WELLCOME CONFERENCE, HELD AT CUMBERLAND LODGE NOVEMBER 1997

Report by Geoffrey J Williams and Sandra J Willson

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Introduction

St Catharine's Conferences are an important part of the work of the King George VI and Queen Elizabeth Foundation of St Catharine's and focus on a variety of contemporary topics. Participation is by invitation and seeks to bring together people from a variety of backgrounds to discuss issues of common concern at Cumberland Lodge in the Great Park at Windsor.

This conference was one of a number that have focussed on education issues (see the list on the back page of this report) and was organised to take place after the publication of the report of the Committee of Inquiry into Higher Education, chaired by Sir Ron Dearing, which appeared in the summer of 1997. In the planning of the conference we were greatly assisted by funding provided by **Glaxo Wellcome plc**, which made it possible to invite participants without charge. ***The Times Higher Education Supplement*** also contributed to its organisation and made five places at the conference available to its readers by competition.

1 After Dearing: where do the universities go now?

The opening speaker, **Sir Richard Sykes**, was a member of the Committee which had produced the Dearing Report, an important landmark for higher education.

SUMMARY

The conference took as its theme the direction higher education might take in the aftermath of the Report of the Dearing Committee. One of the key features of the report was the emphasis it placed on the rôle of the universities in providing a well-trained workforce for the economy and this provided one of the major themes of the conference, another being the funding of research in both sciences and humanities. Issue was taken with the practice, in relation to the Research Assessment Exercise, of distinguishing between research and scholarship. Would the traditional value of the universities, as places which allow critical debate and freedom of speech, be challenged by the rapid expansion of the higher education system and the associated vocational imperative? Other issues considered included the international competitiveness of UK universities, both in attracting students and selling their programmes overseas, and the contribution that they made, directly and indirectly, to the health of the national economy. It was concluded that despite their vital importance to the UK economy, the universities were facing a short-term funding crisis which threatened to damage the long-term vision.

The changing environment

The Robbins Report in the 1960s triggered the first major expansion of the university system, almost doubling the number of universities. The recent removal of the binary division has given a further doubling. England alone has 72 institutions with the title 'university'.

Numbers in higher education in the UK have increased from a little over 320,000 in 1962 to 1,400,000 in 1995. The increase in postgraduates has been even greater, from about 10,000 in 1962 to over 200,000 in 1995 — and the trend continues. Part-time students have risen from about 118,000 in 1962 to over 400,000 in 1995, excluding the Open University. The age profile has also changed, mature students now making up over 58 percent of students entering higher education.

Students enter higher education with a wide range of post–16 qualifications, including advanced GNVQs and Access Courses. The fiction of degree parity is difficult to sustain and the Dearing Report proposed a panel of accredited external examiners to ensure maintenance of standards. As students pay more they will increasingly question the quality of teaching and the qualifications which result.

With over 30 percent of young people now passing through higher education, and likely to exceed 40 percent in the future, universities must take some responsibility for preparing them for the world of work. 'Training the mind' alone is no longer an option.

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The context for higher education

Consideration must first be given to the competitive economic climate of the global market. Britain's success will depend not only on the creation of a knowledgeable, skilled and adaptable work force, but also on the development of a continuous learning culture in which people are constantly updating their knowledge and skills. The link must be understood between a nation's economic success and its ability to provide new products for the global market place. Wise investment in education and research will make this possible.

Constraints on funding are likely to continue. Of the £10 billion currently available for higher education, about £7 billion comes from the public purse. Forty percent supports teaching in the universities through the block grant from the Higher Education Funding Councils (HEFCs) and student fees. Fees from other sources, including overseas students and courses to overseas institutions, provide about £1.1 billion. The great expansion in student numbers in recent years has significantly reduced the level of support per student.

Funding for research in universities comes from both the public (£1.7 billion) and private (£600 million) sectors. Of the former, HEFCs and the Research Councils provide over £1.2 billion and government departments £470 million. However, only about 18 percent of HEFC budgets directly supports research and a significant share of Research Councils' funding goes to support their own institutes. Additional support comes from the private sector and the European Union. Industry provided £170 million for academic research in 1995–96.

Despite the slight overall increase in public funding for the science base, we shall not be able to keep up with our competitors, given the speed of advance in science and technology.

There are serious skill deficiencies in students graduating from many universities

Of the total UK expenditure on research and development (R&D), HEFCs and the Research Councils contribute only 15 percent, nearly half coming from industry. A key issue is whether higher education can provide the output of well-trained graduates needed by industry to sustain this investment. Under-investing in teaching puts the research base at risk and at present there are serious skill deficiencies in students graduating from many universities. Devoting less of its GDP to R&D than many of its competitors, the UK is not investing as it should in science and technology.

Change is an important part of the context in which universities operate. They should be prepared to react to change and their graduates should be creative, flexible in outlook, and able to communicate ideas clearly.

The purposes and aims of higher education

In the 1960s the Robbins Committee recognised the importance of developing skills for employment, in addition to the more generally accepted aims of developing minds, advancing learning and maintaining our culture and civic standards. The Dearing Committee endorsed these but also emphasised the important rôle of the universities in providing the workforce for the economy and encouraging people to engage in life-long learning. Enabling people to achieve their potential throughout their lives puts the universities at the heart of the 'Learning Society'.

The demands facing universities

The Committee made a number of suggestions as to how higher education institutions (HEIs) might adapt to meet the future:

- Diversity should be maintained, HEIs playing to their own particular strengths, be it teaching or research. Some might realise a higher potential by providing applied research or training to businesses in the local or regional economy, rather than by striving for national pre-eminence.
- The relationship between teaching, research and scholarship needs to be clarified. American universities distinguish between public ('corporate') research and private research, which we call scholarship. *Research* in the first sense is seen as the conduct of original investigation which seeks new knowledge, describing new laws or defining new phenomena. In science and engineering this usually involves sophisticated and costly equipment. *Scholarship*, or private research, starts with the accumulated body of knowledge in a field, seeking by re-examination, analysis and synthesis to produce a coherent picture of the whole, to identify trends and connections, to reach new conclusions and offer new insights. Research, scholarship and teaching should feed into and feed off each other. While scholarship underpins research and informs teaching, it also has value in its own right. Successful integration of the three should produce well-educated graduates, able to serve industry, commerce and society generally.
- In a climate of financial restraint, funds must be managed effectively and productively. The teaching and research infrastructure, which in many cases has suffered years of neglect, must be restored and maintained. Work undertaken for outside agencies must be fully funded. Applied research and teaching skills must be more effectively marketed in the private sector.
- In meeting the demand for an educated and skilled workforce, HEIs must understand the needs of employers and produce graduates with relevant skills and qualifications.
- New technologies should be used wisely and appropriately and not as a way of cost cutting: computer simulated practicals are no substitute for the real thing.
- Undergraduates need to be imbued with a desire to be life-long learners.

Meeting the needs of industry and commerce

The needs are for:

- good graduates and postgraduates;
- access to high quality research, both basic and applied;
- facilities for training and re-skilling.

Generalist and specialist graduates are needed, both possessing the core skills we once took for granted — literacy, numeracy and the ability to communicate. Analytical and problem-solving abilities need to be developed. Flexibility — a willingness to change direction and learn new skills — is increasingly important. It is, of course, vital that specialists are well trained in their practical skills, whether in the laboratory, the factory, the hospital ward or the law court.

In 1994–95 less than 30 percent of science graduates took up employment in industry or academia as practitioners in their subject, many entering fields such as accountancy, banking and

teaching. As a response to larger numbers and the expense of practical classes, many science courses now provide a level of practical training inadequate for industry's needs. Only large employers can provide further training to make good this deficiency. Separate university courses for generalists and specialists might be a solution.

The flexible qualifications framework proposed by the Dearing Committee would also allow people to come in and out of higher education as needed, and allow transfer between institutions.

Research in universities

This:

- adds to the sum of knowledge and understanding;
- informs and enhances teaching;
- creates new knowledge and inventions which can contribute to wealth creation and an improved quality of life;
- provides the environment needed to train creative researchers and to maintain the public and private sector science bases.

Decision-making on research funding should be guided by the principles that only research which is excellent should be supported; that separate funding streams should provide for different types of research; and that research must be fully funded with adequate provision for infrastructure and equipment maintenance.

The current trend, whereby the quest for research funding is often at the expense of teaching, must end. Research should promote rather than devalue teaching. This will be assisted if 'private' research is funded. It must be evident where the money comes from, how it is used and who benefits.

Separate funding streams are desirable for:

- high quality research of international standing extending frontiers of knowledge;
- the provision of the infrastructure of research;
- applied research to service the needs of local or regional economies;
- the encouragement of the practice of scholarship; and
- the encouragement of innovation to provide new products, processes and high tech companies.

SPEAKERS

Professor Kenneth Barker, Vice-Chancellor of De Montfort University

Jennie Bristow, Freelance journalist and recent student, University of Sussex

Professor Richard Brook, Chief Executive, The Engineering and Physical Sciences Research Council

Dr Mike Fitzgerald, Vice-Chancellor, Thames Valley University

Professor Martin Harris CBE, Vice-Chancellor, University of Manchester and Chairman, Committee of Vice-Chancellors and Principals.

Professor Geoffrey Johnson, Co-ordinator, Education Programme, Europe, Ford Motor Company

Professor Leslie Hannah, Dean, City University Business School

Professor John Laver, Chairman, Humanities Research Board of the British Academy

Dr Linda Magee, General Manager, Manchester BioSciences Incubator

Sir Robert May FRS, Chief Scientific Adviser to the UK Government and Head of the Office of Science and Technology

Sir Richard Sykes FRS, Chairman, Glaxo Wellcome plc

Invited chairmen: **Professor Ray Baker FRS**, Chief Executive Biotechnology and Biological Sciences Research Council; **Sally Brown**, Head of Quality Enhancement, University of Northumbria; **Professor Howard Newby**, Vice-Chancellor, University of Southampton; **Professor Susan Shaw**, Deputy Principal, University of Strathclyde; **Auriol Stevens**, Editor, *Times Higher Education Supplement*; **Dr Philip Wright**, Senior Policy Advisor, Technology Group, Confederation of British Industry.

Lead Speakers for Discussion Groups: **Dr Tony Ashmore**, Registrar, The Royal Society of Chemistry; **Professor Michael Crawford**, Department of History, University College London; **Dr Michael Elves**, Director, Scientific and Educational Affairs, Glaxo Wellcome plc; **Diana Warwick**, Chief Executive, Committee of Vice-Chancellors and Principals.

The last stream is new and seeks to fill the gap between invention and exploitation which has plagued this country for many years.

The dual support system

There are currently two principal funding streams:

The Higher Education Funding Councils which provide salaries for university staff and the infrastructure necessary for research, and attract grants from elsewhere. They also support researchers starting their careers and undirected 'blue sky' research. HEFCs assess departmental research performance and base their funding on past record as determined by the Research Assessment Exercise (RAE).

The Research Councils which provide for specific projects, and studentships for research training, and assess these in a prospective way.

In recent years there has been increasing dissatisfaction with the dual support system. Nevertheless, there are good reasons for keeping it, its most valuable feature being the freedom it gives universities to support research not funded by specific grants.

Unfortunately inadequate provision for indirect costs in research and failure to invest in university infrastructure has created a funding gap currently estimated at £400 – £500 million. To help resolve the problem, the Dearing Committee recommended that Research Councils should increase their overheads contribution. To close the gap only in centres carrying out high quality research would cost about £110 million annually. New money will be needed for this: to reduce the volume of research or to transfer funds from the HEFCs are unacceptable alternatives. It is a serious problem which, unless addressed, could impact on our industrial competitiveness and economic health.

There are problems with HEFCs' use of the RAE to calculate the level of funding. In 1996 most funding went to departments scoring 4 or 5, with none for 1s and 2s. Unfortunately the RAE takes limited account of work done with industry and is believed to work against interdisciplinary and

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Some Acronyms Used in this Report

CVCP:	Committee of Vice-Chancellors and Principals
EPSRC:	Engineering and Physical Sciences Research Council
ESRC:	Economic and Social Research Council
HEFC:	Higher Education Funding Council
HEI:	Higher Education Institution
HRB:	Humanities Research Board
RAE:	Research Assessment Exercise
SPRU:	Science Policy Research Unit (of the University of Sussex)

collaborative research. It barely recognises 'private' research in the sciences.

Inadequate provision for indirect costs and failure to invest in infrastructure has created a funding gap estimated at £400 – £500 million

The RAE has the effect of pushing HEIs towards hands-on research, whether or not they are up to it. To correct this, funding might be provided on a per capita basis to university departments who stay out of the RAE, in this way encouraging 'private' research and other scholarly activities and removing the imperative to carry out more expensive research. The scheme carries the risk that a department might submit for the RAE but receive a low score and get nothing from either source. It would be fatally flawed if the level of per capita funding is perceived to be too low to be attractive.

Funding arts and humanities research

The arrangement whereby public funding of research in the humanities is channelled through the British Academy is unsatisfactory, creating tension with the Academy's rôle as an independent voice for the arts and humanities community. The level of funding is also inadequate. A new research council was recommended to fund the arts and humanities with an appropriate budget.

Ensuring university infrastructure

To maintain and develop equipment and infrastructure in top rated research departments an Infrastructure Loan Fund was proposed of about £400–500 million. How such a fund might be created is the main problem as it would offend current Treasury accounting rules, and industry and charities are reluctant to contribute funds which became anonymous and dispersed. The Government needs to look at the problem creatively. In theory, the fund should be self sustaining, so offering a long term solution.

Supporting local and regional economies

Collaboration with local industry and commerce would be assisted if the current mixture of schemes with this aim were brought together in an 'Industrial Partnership Development Fund'.

Encouraging Innovation

Academic research can lead to potentially useful and exploitable products but funding and other constraints make it difficult to test and develop them in a commercial context. Technology Incubators may offer a solution: centres alongside universities or research institutions to enable the potential of research and new products to be established.

What now?

The universities must develop their own missions in a system in which diversity is the cornerstone

To ensure the future of our universities and to maximise their contribution to UK plc:

- *The universities* must develop their own missions in a system in which diversity is the cornerstone. New universities cannot all be like the old civic universities; if they try the price of failure will be high. Where appropriate new technologies must be taken up and harnessed to teaching and research; the use of plant and resources must be optimised. Qualifications and degree structures must be examined innovatively to ensure that the needs of both students and employers are well served. The enormous potential in providing resources for life-long learning should be recognised.
- *Government* must encourage collaboration between academia and industry.
- *Industry and Commerce* must make it clear what they expect of the universities and play their part in ensuring that graduates are 'fit for purpose'. Meaningful work experience is more than just providing vacation jobs! Companies should also realise that local universities can be an important resource, with the possibility of collaboration in workforce training and in basic and strategic research. Staff should be encouraged to engage in life-long learning and to look to the local university for help.

In sum, we should seek to create a virtuous circle involving academia, government and industry to ensure that the UK is able to use its best talents, and its excellence in universities and industry, to compete as a major player in the world-wide market place. The consequences of failure would be dire.

2 Are universities a safe place for scholarship?

To identify scholarship as separate from research, suggested **Arthur Lucas**, must concern anyone with an understanding of what scholarship really means. The 1996 RAE distinguished between research and other scholarship, the former being eligible for assessment whilst the latter, including the development of teaching material, were excluded. The Dearing Report puts it succinctly: 'Scholarship [is] the personal assimilation of existing knowledge; research the pursuit of new knowledge' (Appendix 3, para 13).

Distinctions based on the nature of, or motivation for, an activity are questionable, as is the distinction between public and private knowledge. Is it helpful for the RAE to classify work on a text-book as non-research scholarship, but to accept it as research if the aim is to produce a monograph? The distinction seems science-based: setting up an experiment and collecting data is research, but reading published works is scholarship. This rigid distinction would have ruled Darwin's *Origin of Species* ineligible for consideration by the RAE, based as it was largely on evidence provided by others!

Such distinctions run into severe difficulties when applied to the arts. In history, for example, only studies using manuscript sources could be termed research. Arthur Lucas is collecting and editing the correspondence of Ferdinand von Mueller, a 19th century German-Australian botanist. When published, its use as a source in studying the interaction of science and

government in colonial society would be excluded as research — but it would be acceptable if the same material was consulted in its archival sources! This is patently absurd. Literary research too would be restricted to interpretations based only on working drafts, notebooks and marginalia.

Might motivation be a more satisfactory distinguishing factor? The Dearing Report tends to this position regarding work undertaken to advance personal knowledge as scholarship, but as research if publication results and it contributes new public knowledge.

To distinguish in this way between scholarship and research is futile. Nor has it been helpful to try to give value by labelling them 'scholarship' activities ruled ineligible by RAE criteria. Rather, the term scholarship should be used to identify the qualities which distinguish good from bad research, good from bad teaching.

To distinguish between scholarship and research is futile

Good research is more than the deployment of high quality technical skills in data collection. It is a function of skill in research design, the creative exploitation of existing knowledge and the interpretation of new data to produce a generalisable result. Some high quality technical research may not meet the 'scholarly' test. In the humanities, too, not all work based on detailed archival research can be classed as scholarship, particularly if the evidence gathered is used uncritically. 'Good' research in science or the arts is scholarly because it offers a critical reflection on the nature of the problem, be it the result of experiment or from archival or literary investigation. The better the scholarship the more value added to assembled information.

Thus scholarship cannot be defined as an activity, nor as an end. It is not a private activity resulting only in the accumulation of existing knowledge by an individual. Rather, it is a quality.

There are pre-requisites for scholarship other than technical skills:

- *Access to information*, which IT is making easier. Electronic facsimile versions of ancient texts make use of originals less necessary and the capacity to enhance and enlarge images aids interpretation. Restrictions on information availability are a potential future threat.
- *The opportunity to reflect* on information, to synthesise it and so add value to it. This is threatened by increasing student numbers and expanding teaching work loads. The pressure to publish is more subtle and dangerous, encouraging researchers to go into print at a stage when further evidence might be sought or time given to reflection. The result is a more technical and less scholarly approach. Thus both *work load* and induced *work pattern* could inhibit scholarship.
- *Access to modern equipment*, enabling the full range of scholarly skills to be deployed. In the sciences especially, funding constraints might also constrain innovation.

Scholarship is further threatened in teaching. The use of IT to enable 'master teachers' to instruct students all over the country might seem a far off threat. However, increasing specification of the nature of subjects is likely to come from central quality control agencies and teaching could become more technical than scholarly. Curriculum standardisation presents a major threat to scholarship with the prospect of the university system producing a generation of graduates who have not been challenged by their teaching. Although the Dearing Report emphasises diversity of mission, most of the structures it recommends lead towards homogeneity and convergence.

Arthur Lucas concluded that scholarship is under threat, and critically so in teaching, but there are also implications for research.

Jennie Bristow recalled three events of recent years indicative of change in the university system — the Reading professor acquitted on a charge of indecent assault brought against him by two young women; a dispute at Bath University over naming the student union coffee shop 'The Melting Pot', which the Equal Opportunities Officer thought promoted 'a stereotypical image'; and a student campaign against an Edinburgh University psychology lecturer who sought to publish a book claiming that black people were genetically less intelligent than whites.

There is a trend towards curtailing freedom of speech and constraining relationships

These events illustrate a trend towards curtailing freedom of speech and constraining relationships between academics and students. Freedom of speech is fundamental to scholarship and research.

Freedom of speech is particularly threatened by the actions of the National Union of Students (NUS) and the student unions, often with the support of the university authorities, which have managed to block groups and individuals from speaking on university campuses. Claimed to counteract prejudice, it is discrimination against people holding particular political beliefs and an attack on freedom of speech. At Sussex in 1995 the Students' Union actually voted to get rid of the historic commitment to freedom of speech on the basis that it contradicted their equal opportunity policy! Student unions seem to operate on the basis that you can say anything you like as long as you don't offend anybody!

Whilst the activities of student unions might be dismissed as marginal, the university system generally has been imbued with the desire to promote a culture of inoffensiveness. The relationship between tutors and students changed as policies on harassment were put into place and the more paranoid were encouraged to complain. Sheffield Students' Union has drawn attention to 'academic bullying', by tutors or fellow students, arguing that people need to be encouraged and not be intimidated by the more forceful or capable. Under such pressures, academic staff will need to 'watch their backs'.

Government policy seems to be to push as many students as possible through the system and encourages those teaching undergraduates not to give high priority to critical thought or to developing new ideas. The approach to teaching is becoming more like that of further education and the schools.

When students are challenged academically, the response is often to question credentials rather than engage in academic debate. Thus in the case of the Edinburgh psychology lecturer, students boycotted his lectures because of the views he represented, but did not attempt to challenge the academic basis of his research. Jennie Bristow recalled a woman student who refused to present a critique of one of Conrad's books on the ground that he was a misogynist, an objection accepted as valid. Large areas of literature could be dismissed because the writers come from the 'wrong' political perspective. Such attitudes do not encourage students to be enquiring or critical. Subscribing to

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correct attitudes, to people or to ideas, seems more important.

This is not the result of an NUS-led conspiracy, but the culmination of a number of factors both within and outside the universities. What can be done to rescue the idea that university education should be about free enquiry and critical debate?

➤ In opening up discussion it was noted that the issue of utilitarianism linked both presentations. The sense of the university ideal as in Newman or Humboldt seems to have been lost in the move towards a mass system of education and no other model has replaced it. Confidence has also been lost in the Enlightenment ideal that human progress can be achieved by the advance of knowledge.

How long will universities continue to function as 'disturbing places'?

Both speakers had, in different ways, questioned academic freedom. How long will universities continue to function as 'disturbing places'? Too easily, it was suggested, they have fallen in with external agendas. The pressure for courses to have a clear vocational outcome was strong and academic activity was seen as particularly worthwhile if it brought in measurable profit. Is critical debate a luxury that we can no longer afford? Others did not see academic freedom under threat; nor did they see academic freedom as incompatible with elements of utilitarianism. The universities have to recognise the rôle they play in serving the needs of the British economy.

There are dangers in being over-reliant on government or industry to underpin key functions of the universities. Diversity of funding should be encouraged.

Were the changes on which Jennie Bristow had focussed surprising, given the move away from a university model which had many of the characteristics of a gentleman's club: male dominated and with a uniformity of social origins and aspirations? Within such a community one could afford to say unpleasant things without being misunderstood. But in the wider community of people which characterise today's universities it is possible, without realising it, to be deeply offensive. One of the functions of the university suggested by Robbins was to forge a common culture. In today's diverse academic communities we might instead need to forge the ability to be critical in terms which are polite to each other.

3 UK universities plc: an export industry?

Kenneth Barker described the challenges Britain must overcome if it is to continue to operate in world markets on the same scale; meeting those challenges being of vital importance to UK higher education as an export industry. The size of the industry today should be recognised. In 1995–96 the overseas earnings of the UK higher education sector were £1.78 billion, 4 per cent of the total UK service sector earnings. That success has been based on Britain's strong links with Commonwealth countries in the English speaking world. It is now under threat as countries like Singapore and Malaysia are becoming more self sufficient in providing for their needs; developments that Thailand and Indonesia are trying hard to emulate. This threat is further increased by the aggressive marketing of competitors from Australia and America.

To prepare to hold its market position and be 'fit for purpose' in the 21st Century there are some important changes and factors UK Universities have to recognise:

Technological developments may mean that high quality education can be provided more cheaply and more efficiently than it is today. However, although the Web and Super Janet are used extensively by administrators and academics in UK Universities, they do not seem yet to be embraced fully in the potential of new technology for changing approaches to teaching and learning.

Recent developments in the US in particular challenge UK higher education

Competition from other university systems is increasing globally. Recent developments in the US in particular challenge UK higher education. These include:

- Large consortia of universities being formed to offer wider opportunities for access than any one university can provide.
- Major software packages being designed to provide management infrastructure to help colleges and universities use computer networks to redesign learning, teaching and administrative functions.
- An increasing use of the internet: The 'World Lecture Hall', for example links Web pages created by faculty world-wide to deliver class materials such as assignments, lecture notes, examination information, and multimedia textbooks.
- The private brokering of educational services: a growing number of new companies with sharply focused marketing strategies based on a high quality authorship of materials and competitive pricing are providing courses below the costs at public universities.

The ***Governance arrangements*** of UK universities hinder the co-operation needed to conduct a global business. While the ability to respond to increasing and rapidly changing demand for higher education depends on the provider having or being part of a critical mass, there have not been many mergers nor has there been much large scale collaboration. This seems to be because UK Universities enjoy a high degree of autonomy. Added to this, there are enormous difference between the 'old' and the 'new' universities, and between one university and another, whether old or new. Nevertheless, universities may eventually be forced to find ways of working together more closely and contractually if they wish to remain effective in world markets. De Montfort University wishes to remain in World markets. Today it is mainly in the Pacific Rim, Europe, Eastern Europe and Russian, South Africa and North America. The work is carried out in a variety of contexts, for example, it has a campus in South Africa, a contracted joint venture and several Franchise arrangements in the Pacific Rim and it has a range of research networks and bilateral research agreements. But it is all on a relatively small scale compared with an American view of what will be viable in the future. So it recognises the need to collaborate, to find partners to be part of building an effective consortium.

Leslie Hannah suggested that university administrators in Britain are becoming increasingly aware that they must develop a more market-orientated system. The attempts of the British government over the past thirty years to find the best system of financing higher education have failed and now universities need greater awareness of the changing nature of international markets and to be more proactive in selling higher education to foreign students.

It is appropriate that universities are internationalised institutions. Not only are international classes an enriching

experience for students, but the money gained from overseas students is important for maintaining a high quality of education.

There is a good deal of anecdotal evidence that some British universities have lower entrance standards for foreign students. While the number of British students that universities can accept is limited by the British government, there is no limitation on the number of overseas students, so universities can make admissions without being externally constrained. Despite the LSE's well known commitment to foreign students, entrance standards for overseas and domestic students are broadly equal; indeed they are slightly higher for foreign students (though this is because such students tend to apply for subjects like accounting with unusually tough entrance standards).

Typically the income from British students (fees + HEFC grant) is about £3,000, but overseas students often pay £6,000 – £8,000 in fees and few universities in the UK offer low cost courses to foreign students. Such variations in the fee structure and entry requirements indicate that foreign students may be being overcharged in order to subsidise British students, a policy which is not sustainable or fair.

An overview of the international flow of students indicates an overwhelming dominance of Asian students studying overseas. In the UK 40 percent of students from abroad are Asian, while in the US 65 percent are from Asia. Overseas students are mainly postgraduates: 11 percent of UK undergraduates and 38 percent of graduates are foreign. More students go to America for postgraduate education than to other countries. It seems Britain is in the second rank in this field. Oxford and Cambridge are no longer able to keep up with the best American universities in economics — by US peer review analysis only the LSE is regarded as being in the top twenty higher education institutions of the world in economics.

At British institutions high postgraduate fees are used to subsidise undergraduates

An important reason why Britain is not able to keep up with America seems to be that income from undergraduate education is too low, while postgraduate fees are high. American institutions such as Harvard fix undergraduate fees substantially above cost to subsidise research and postgraduate education, but at British institutions high postgraduate fees are used to subsidise undergraduates. In postgraduate education UK universities have pricing freedom, but for undergraduate education the government has fixed a very low and declining price. Again the British government is to blame for a major and damaging market distortion.

The flow of international students is from developing countries, especially the rapidly developing countries, to advanced countries. Under-developed countries such as those in Sub-Sahara Africa generally need to buy teacher-training and agricultural expertise as an investment in the early stages of development. While students from these countries have often studied in Britain, they are increasingly going to countries which can provide education and training more cheaply. Rapidly developing countries are prepared to pay for education in business, engineering, and computing as a 'catch-up' investment. 'Asian tiger' economies need to acquire skill and knowledge in subjects which will contribute to their economic growth, and in which the old industrial countries have expertise and teaching resources. Students from the developed world are more prepared to pay for an education in the humanities and the social sciences, although many see these as luxury goods with uncertain economic return.

The demand from the 'Asian tigers' for education in the engineering fields will eventually disappear as these countries become self-sufficient. If Latin America and possibly Sub-Sahara Africa become rapidly developing countries, there may still be very substantial demand for the developed world to provide engineering education. There is still a massive market for business education, and there will probably be an increased demand for international trade in 'luxury' subjects such as the humanities and social sciences. Britain is well placed to take part in international free trade in these subjects.

There are a number of dangers with the present British system. The ban on charging students high fees for undergraduate education limits the ability to provide really high quality courses, yet there appears to be a demand for quality education which uses the Oxbridge tutorial system. In addition, the universities must overcharge overseas students so the British government can pay less for higher education. In the long term this is unwise; there is a limit to how much people will pay for a degree from Oxford, Cambridge or the LSE.

Apart from the ultimately negative consequences of the government's guidelines on fees, it is likely that higher education will remain an important source of revenue and intellectual enrichment for Britain. It is, however, important for universities to respond to the changing nature of demand for higher education if they are to continue attracting overseas students.

➤ In discussion it was explained that a consortium called 'Scottish Knowledge' has recently been established to market the education services of Scottish universities internationally. As the company is privately financed it has to make returns to share holders, and the chief executive is empowered to make decisions quickly. The notion of consensus and government by representation is not possible in this market-driven organisation. If successful, Scottish Knowledge will have major implications for the organisational structure of universities as coalitions will form and the quality standards of universities will be more sharply defined.

It is important for Britain to find alternative markets for higher education as the Pacific Rim countries become more self-sufficient. Within ten years Latin American countries could be demanding education in business and engineering. While America and Spain are obvious destinations for people from such countries, the British Council is optimistic about its recent attempts to market education in South America. South Africa and India are also potential new markets.

It was noted that not a great deal of mention had been made of European students who come to Britain, perhaps because students from the European Union pay the same fees as British students. As a large number of students come from the Continent it is important to consider the integration of standards and possibly institutions across Europe.

4 UK Universities plc: a national training agency?

Mike Fitzgerald suggested that the place of universities in society will change radically in the coming years. The UK's economic strength will increasingly rest on education; intellectual property will be our major commodity. As Britain becomes a knowledged-based society there will be

greater on-going investment in education by employers and businessmen, and education is bound to become more politicised.

The demand for continuous upgrading of skills and qualifications will increase as education becomes more closely tied to employment prospects, and many people will want to study while they are also working. There will be greater demand for higher education to be accessible and more widely available. Currently 31 percent of 18–19 year olds are in full-time higher education, which is a low rate of participation compared to North American or South-east Asian countries. Britain cannot be described as having a mass system of higher education and a great challenge facing universities is how they can enable more people to participate in higher education.

Universities will become network-based, rather than campus-based, and education will be freed from the constraints of time and space

Universities have always been defined in terms of a community based in a particular geographical location, but increasingly the definition will refer to a community of people who are users of the new technology and new forms of communication. Universities will become network-based, rather than campus-based, and education will be freed from the constraints of time and space. Information technology will be used to create a network linking education undertaken at the university, a person's home and their place of employment. Rather than some people studying at university, some at home, and some doing employment-based education, there will be the chance for an individual to undertake education through all these contexts. Technology and communication should allow more and more people to undertake further education, and allow them to undertake a programme of study which meets their particular needs and circumstances. It is hoped that the universities' rôle of fostering original and independent thought will be achieved on a much larger scale. In other words, the network may make it possible for the highly individualised tutorial system, akin to the Oxbridge system, to operate across the country.

It is easy to think of students as simply consumers of education, yet the best teachers and the best technology will not be worth very much if students do not themselves respond by taking responsibility for their learning. The great challenge for universities is to use the new technology and communication network so as to foster the active involvement of students. Education is not just about acquiring a mass of information, or learning skills and competencies. It is about giving people the confidence to learn, to grow, to ask questions, to be curious about the world, and to dream dreams — not only for the individual's sake, but for society at large. Do universities have the confidence individually and collectively to realise this aspiration?

Geoffrey Johnson explained the Ford Motor Company's commitment to what it calls 'Continuous Professional Development'. Many employers believe education only needs to be undertaken before starting a career, but it is Ford's conviction that continuous learning and education throughout a working life is important for the employee, the company and ultimately for Britain.

Ford is the second largest producer of vehicles world-wide with sales revenues of around $150 billion and in a year it spends $300 million globally on education and training. As technological knowledge has a half life of about five to seven years, there is a vital need to update employees' knowledge and skills if Ford is to continue being at the leading edge of competitive development. Ford has also found that employees are three times less likely to leave the company if they have completed a company sponsored degree than employees who do not undertake such study.

Continuous learning and education throughout a working life is important for the employee, the company and ultimately for Britain

Ford is clearly very committed to higher and further education and is concerned about a number of issues raised in the Dearing report. These include:

- The Dearing Report argues that more funding is needed for universities if Britain is to be at the leading edge of research. Yet perhaps Dearing assumes that universities undertake all research work without acknowledging that sometimes industry might be the more appropriate locus for research. Rather than universities seeking more funding from research councils, they could develop stronger links with industry and use industry as a research base.
- The Report recommends, rather tentatively, that the HEFCs and Research Councils should encourage collaboration between institutions. More boldly, it might have suggested some alliances in regional centres, or in large cities where there are several universities. Instead of competing for business, universities should collaborate to develop centres of excellence.
- The Report emphasises the importance of educating 18 year olds, but it is also important to provide upskilling and education for 35–40 year old managers. If Britain is to compete in a world economy, middle-aged managers must be educated to the level of their counterparts in the US, German and Japan.
- The Report emphasised the importance of all graduates having communication, numeracy and IT skills. It is also important for IT literate graduates to be able to keep pace with technological change and the employer must be responsible for updating skills.

While Ford's professional employees are likely to be recruited at graduate level, when they join the company they are encouraged to take professional qualifications in their functional sphere — engineering, sales, finance, human resources, systems etc. After three years of work they are encouraged to study for masters' qualifications in either business or engineering. Ford has various training schemes and probably the best known is the Employee Development and Assistance programme, which allows individuals to select their own programme of study from a wide range of choices.

University / industry collaboration has been widely recognised as one of the most effective engines for innovation. Over the past ten years Ford has been developing short-term training and long-range part-time education with university partners throughout the world. Ford's partnership with universities allows individuals to study subjects where Ford's leading-edge technology is taught with academic studies. There are also consortia degrees in which Ford works with universities and other blue chip companies. Ford is now exploring ways of using IT so education can be delivered in a more flexible manner. Ford's intra-net is a secure system which links selected university depart-

ments around the world. Higher and further education has a major rôle to play in national competitiveness and it is in the interests of both universities and industry to work more closely together.

▶ The vision of a university being network- rather than campus-based raises questions about how research will be carried out in the future. Should research councils be thinking in terms of allocating funds to research institutions rather than universities? It was noted that while the idea of a university based on a network is developing, this will not necessarily do away with university campuses. Researchers are also benefiting from the use of the new technology as they can now be connected to other researchers throughout the world.

There was considerable debate about society's and the universities' definition of knowledge. It was suggested that Britain is not so much a 'knowledge-society' as a 'society of knowledges'. Different groups in society want education to achieve differing outcomes and so universities are being challenged to widen their scope. There has been diversification within disciplines, and new disciplines have emerged, so there is no longer a fixed idea of what counts as knowledge.

There is a danger that in the future universities will merely have the function of accrediting prior-learning, knowledge gained in the work environment, without fostering real intellectual development. In reply it was noted that the definition of knowledge is being broadened. People can learn in a formal educational context, but also in more informal ways. New technology is enabling us to connect these different contexts more easily, but there is still a strong commitment to learning and knowledge gained through an institution of higher education.

5 The science base: a personal view

The last decade had, said **Sir Robert May**, been a time of unparalleled change in British higher education, which had expanded enormously at a time of increasing constraint on public expenditure. Research funding sources have become more diverse and there have been marked changes in the collaborative pattern of research.

In just seven years, since 1989, there has been an increase of students in higher education from 600,000 to 1,050,000 — a 75 percent increase. The 31 universities of Robbins's time have increased to 115. Although during that period there has been a three-fold increase in student numbers, the number in science and engineering has only doubled. Paradoxically, the former polytechnics have a smaller proportion of students in these fields than older universities.

Government policy over the past decade has driven down public expenditure so that as a percentage of GDP it is one of the lowest in Europe. This has reduced the civil service from about 600,000 to significantly under 400,000. So university expansion has taken place at a time of massive contraction in public spending. The 75 percent increase in student numbers has been accompanied by a rise in public expenditure on higher education of 30 percent — from £6.0 billion to £8.1 billion.

Over the last ten years the amount of money spent on the science base, through HEFCs and the research councils, has increased in real terms by 10 percent. In the same period employment in science and technology increased by 30 percent, numbers of postgraduate students by about 50 percent, and undergraduates even more. The perception that life in the science base has got worse is unsurprising: the per capita funding is less and the work required is greater for the 130 people employed where ten years ago there were 100.

In Britain the Government's contribution to funding research as a percentage of GDP is one of the lowest

Comparison, with G7 and other major countries, of funding for research in universities shows that in Britain the Government's contribution as a percentage of GDP is one of the lowest, whereas the contribution from business is one of the highest. Support from charities and overseas is the highest for any G7 country. Our funding streams are more diverse than most.

Spending on the science base in the UK, which was significantly higher than the OECD and G7 average 15 years ago, has since shown a significant decline, partly offset by increased private support. The latter has mainly supported applied research and development rather than pure research.

Research has become more collaborative with half of all papers published in the UK now having three or more authors coming from two or more institutions. In ten years the number of papers resulting from industry and academia collaboration, although small (2.5 – 5.0 percent of the total), has increased by a factor of three.

Internationally the picture is similar, the number of British papers with at least one foreign co-author having almost doubled in ten years. We are ahead of most countries in this respect. Increased collaboration poses problems for the management of research.

Sir Robert thought the dual support system demonstrates 'creative eccentricity', peer review being used to determine funding whilst basic infrastructure is provided by block grants from another source. Such a system might have been suitable in the Robbins era, but not in the current setting. That English, Scottish and Welsh Funding Councils operate separately whereas Research Councils span the UK, adds a further complication. To imagine that these funds, together with funding streams from charity and industry will somehow match up to deliver the required infrastructure is to ask a lot!

In fact, the system seems to have worked extraordinarily well, although Sir Robert thought it inherently unstable. In recent years Vice-Chancellors have discovered that the only funding which they can influence is that from the RAE, creating the perverse wish of all to become research universities. Research should not provide this incentive because much research funding comes with inadequate or no provision for indirect costs, so that in financial terms there cannot be an overall gain.

The key recommendations of a recent US report on higher education[1], analogous in certain respects to the Dearing Report, are relevant to the British situation:

- greater mission differentiation, with individual institutions focusing on areas of comparative advantage;
- major change in the governance of universities so that decision makers can assess the relative value of departments, programmes and systems to reallocate scarce resources better;
- sharing arrangements to improve productivity.

In the British context, if half of all scientific papers involve the collaboration of two or more institutions, it

1 *Breaking the Social Contract — the Fiscal Crisis in Higher Education*. Council for Aid to Education and the RAND Corporation.

DISCUSSION GROUPS

The conference divided into smaller groups to discuss four sets of issues. The topics were introduced respectively by Professor Michael Crawford, Dr Tony Ashmore, Diana Warwick and Dr Michael Elves. Points made by these groups include:

1. Who learns, teaches what, where?

- Given that student ability and expectations are now very varied, it would be both impossible and unhelpful to impose a unified model of learning.
- It is recognised that the aim of higher education should be to develop the potential of individuals to the fullest, but there are difficulties with such an ideal and there are clear advantages in dealing with students of homogeneous ability. It was recommended that (a) there should be a clearer system of post–16 gateways and decision points in education to replace the present 'fuzzy' system; and (b) HEIs should develop niches of specialisation in teaching and research.
- The educational experience as a whole has an importance over and above individual subjects and the intellectual cultivation of the individual is central.
- The distinction must be made between *education* and *training* and for universities, education must be central.
- Completely regionalised universities drawing students only from near by are unattractive.
- There is now a much closer relationship between higher education and industry, with some companies operating virtual universities.
- The concept of a traditional university offering contact and basic courses whilst IT provides access to specialist modules needs to be investigated.
- Institutions must have embedded values and strategic plans which should not be mere window dressing.

2. Quality assurance in UK universities

- *Standards* and *quality* need to be seen as different. Standards are key and refer to the levels of student attainment, which legitimately varies with course, department and institution. There should always be a striving for high quality, whatever the standard.
- It is recognised that defining standards in disparate disciplines is very difficult. Standards are best set by national professional bodies, when such exist. Where appropriate, training levels should accord with international standards.
- Grading systems should be less crude having profiles which match aims with assessment and grades for individual courses rather than degree classifications.
- Universities should improve selection methods.
- Degree content should be defined more specifically and show coherence and progression.
- Universities should be given appropriate resources for the task, or be allowed to operate in a free market.

3. The qualifications framework in the UK

- The higher education examination system should remain based on particular disciplines with quality assured by subject specialists.
- There should be a wider range of exit points from higher education.
- Dearing's profile would only make sense if a national curriculum for higher education is imposed, and that should be resisted.

4. Professional development and life-long learning

- Life-long learning is driven by the varied needs of personal enrichment, professional updating, access, changes of direction and integrationist consultancy work. The tendency towards short term contracts in employment is a significant factor.
- How are development needs identified, especially for people in smaller companies?
- Partnerships between universities and companies should be encouraged at both course initiating and development stages.
- Learning should be made more accessible through flexible delivery: the potential of IT for life-long learning has not been adequately evaluated or developed.
- Life-long learning is dissolving the separation of the universities and the wider community.
- Universities should train their own staff too!

seems eccentric to provide infrastructural support to departments rather than to the groups of people doing the work. The latter arrangement would make it easier for excellent people in institutions which are not primarily research institutions, to interdigitate with major research institutions. At present such people often have small postgraduate programmes built around them. Britain has 75 Physics PhD programmes, compared with just 140 in the USA which is five times as big and has a GDP more than seven times larger. In America, each state has continuous review of postgraduate programmes, closing those with questionable performance. In Britain anarchy masquerades as autonomy!

These issues can be summarised by the word 'selectivity' — but not the selectivity associated in Britain with the creation of a one-dimensional hierarchy of snobbery. All too frequently the idea is strengthened, consciously or unconsciously, that the highest aspiration of the recipient of a higher degree is to become an academic. Only those that fall by the wayside will dirty their hands in industry, or enter the Civil Service.

We live in a tougher world than the sixties, when anyone with a PhD could get a job in one of the new universities and the dual support system allowed them to potter around in a laboratory. Today we have widened the reach of higher education beyond an elite of one eighth to a third, and it will widen further. But this 'elite' must have more varied aspirations. We should seek to emulate European countries, and America, which have been better at producing skilled people who take pride and satisfaction in being skilled people. To make this possible we need to focus on differentiation within co-

operative frameworks, making it possible for students with the right skills and motivation to move from undergraduate teaching institutions into institutions with a research focus. Others, some of whom might even have acquired PhDs, might recognise that the challenge of a lifetime in a research laboratory is not for them and should be encouraged to move into the more supportive and structured settings offered by other professions.

We should seek to emulate countries which have been better at producing skilled people who take pride and satisfaction in being skilled

➤ In discussion Sir Robert was asked how many Physics departments offering PhD programmes did he see as appropriate and how the selection might be made. When pressed, he suggested a reduction might be made to around 40 with selection on a basis of comparative review. Unlike America, in Britain the entitlement to award PhDs rested with individual universities and legislation would need to be introduced if external regulation was to be applied.

Sir Robert considered that the facilities of our best departments are comparable with similar departments elsewhere, but he was concerned that scarce funds are being spread too widely, noting that of the £55 million dispersed to Chemistry Departments in the 1995 RAE, half went to those with a rating of 3 or below. Difficult decisions have to be made but a policy of concentrating excellence and resources makes sense.

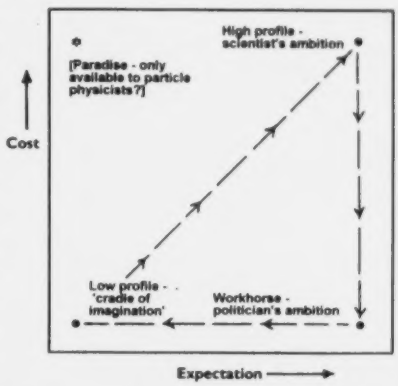
Concern was expressed that with many students in future graduating with an accumulated debt of £10,000 – £15,000, few would be able to contemplate staying on for a research degree. Too often government imposed changes on the university system gave the impression of unnecessary haste, with little thought to funding implications or of long term impacts.

6 Funding for research

The focus of the session, said **Richard Brook**, was on the difficult interface between science and politics. Why should scientific research be supported by the public purse? The amounts are considerable: currently £1.3 billion annually, of which the Engineering and Physical Sciences Research Council (EPSRC), which he heads, accounts for £370 million.

Three models offer different responses to this question. The first has been provided by the Science Policy Research Unit (SPRU) of the University of Sussex which has suggested six benefits: (1) new and useful information; (2) new instrumentation and methodologies; (3) skills development; (4) access to networks of experts and information; (5) the provision of people skilled in solving complex technological problems; and (6) the creation of spin-off companies.

A second model suggests a circular flow of benefit between Government which provides funds; the agency (such as the EPSRC) which makes the allocation; the researchers who carry out the research; and industry, representative of society as a whole, which benefits from the research and also pays taxes to the government.


High profile - scientist's ambition
[Paradise - only available to particle physicists?]
Cost
Low profile - 'cradle of imagination'
Workhorse - politician's ambition
Expectation

A third model (see diagram) graphs cost against expectation. The location of a research activity on this diagram may change over time. At bottom left you have what might be termed 'the cradle of imagination' — the Newtonian apple scenario where costs and expectations are minimal. But a breakthrough might come, and as investigation develops, costs rise along with expectations. Every scientist's ambition, the high profile position at top right, might be attained. The politicians' ideal, the 'workhorse' position, is at bottom right. If results prove disappointing, funding might be curtailed, even though researcher expectation remains high. The time might come when funds are exhausted and the work is given up as hopeless, completing the circuit to return to the starting point. Some research projects — cold fusion is an example — go around this circuit very quickly; others may take many years.

Research funding in the 1970s was wholly responsive, the funding agencies responding to proposals brought to them. In the 1980s it became more managed, the councils identifying research needs and inviting proposals for funding. By the early 1990s, the responsive mode of funding had declined to only a third. This trend has now been reversed, with the recognition that original, inspired and competent work is more likely if the initiative comes from the research community.

The EPSRC uses two panels, one of academics and the other of industrialists, to allocate funds across eight subject areas (mathematics, physics, chemistry, three in engineering, materials technology and information technology). Assessment criteria include competitiveness, quality of life impact, researcher competence, industrial utility, and the availability of other sources of support.

Quality of life assessment is difficult, except on a personal basis, although it occurs in all subject areas — recovery of contaminated lands, sustainable cities, energy efficiency, etc. Paradoxically, the arguments presented for them are nearly always market-driven.

Before research proposals come before review panels, they are assessed by references drawn from a peer review college elected by the research community. The mean age of principal researchers is between 46 and 48 and over half the members of most peer review colleges are over 50. Clearly, when asked to nominate a peer review group, members of a research community pick colleagues resembling themselves, and when peer reviewers pick a research community, they do the same. Seniority is strengthened, disciplines are strengthened, the mean is strengthened. Not surprisingly there are few women — only about five percent of the colleges.

Peer review has to work, yet this tight loop of reinforcement is not helpful. How should a research council respond? It cannot make selections itself as that involves academic appraisal skills which it does not possess — nor would it be desirable for it to do so. What it can do is to introduce an element of positive discrimination: EPSRC is now to require the nomination of a proportion of women and people under 40.

Returning to the issue of why there should be public support for research, the linear model has proved to be highly seductive (research — results — development — product — enterprise

creation — jobs). Politicians like it and it sometimes works that way, especially in the medical field. Indeed, some universities do well from royalties gained from drug-related research. But you cannot justify the investment of the amounts involved by saying that it produces a few inventions or creates a few spin-off companies. Rather it is to ensure we have a community of skilled research workers with the competencies required to manage future change. Policies must emphasise training rather than widgets.

The investment is to ensure we have a community of skilled research workers with the competencies required to manage future change

EPSRC thus supports training throughout the university system, linking through into industry — from undergraduate to post-doctoral levels. It will be clear that of the factors identified by SPRU, skills is the crucial one, but there are problems in addressing quality of life issues, and concens about peer review.

John Laver of the Humanities Research Board (HRB) of the British Academy, pointed out that although the dual funding system works tolerably well, for the humanities it is highly asymmetric. Reliance on funding council block grants is overwhelming, the HRB provision for research being vestigial. Of the total external research income for English Language and Literature in 1994–95, for example, 93 percent came from HEFC, whereas for Physics it was just 11 percent.

Of the 48,000 staff declared to be research active in the RAE, almost a quarter (11,000) are from the humanities and arts, excluding law. This compares with about 13,000 in social sciences. Of the £21.5 million that the HRB distributes annually, most goes to provide almost 1,000 studentships and bursaries. Only £3.5 million goes to support research.

John Laver had been the humanities adviser to the research working group of the Dearing Committee and he outlined the case made there for better funding of humanities research.

Problems with the quality of life argument had already been highlighted. Gains are material and non-material, the latter featuring most prominently for the humanities and arts. Research in these fields has an economic impact, but in terms of the linear model, the chain is longer with a more diffuse set of intermediaries.

The Committee was not moved by the case for the intrinsic benefits of humanities and arts research — to the individual concerned and in contributing to a rational and culturally-rich society. Yet only about a quarter of doctoral graduates in the humanities become academics, the rest taking up an enormously versatile range of employment — surely, a key justification for funding advanced study. The Committee was more receptive to the case for instrumental benefits such as to tourism and leisure industries, to the conservation and presentation of our heritage in museums, libraries, galleries, etc. This is important at a time when there is evidence of a shift from manufacturing towards culture as an economic activity.

The Committee was presented with four options. The first, to increase funding to the HRB, was seen to conflict with the British Academy's other rôle as an independent voice for the humanities, social sciences and arts communities. The second, to transfer responsibility for humanities funding to the ESRC, had its attractions, but the possibility of conflict between the two communities could be problematic. Of the two other options — a separate Humanities Research Council, or one which combined humanities and arts, the latter was favoured, the arts, seen as having more direct economic benefit, offering strength to the association.

The Dearing Report recommended that the new Humanities and Arts Research Council should be established as soon as possible within the Office for Science and Technology of the Department of Trade and Industry. A co-location with other research councils would enable sharing of indirect costs, expertise and relevant best practice. Total funding of £45–50 million annually was proposed, half of this being transferred from the HRB, the other half being new money, building up to this level over a three year period. The increased scale of funding is critical and it must be new money, not funds siphoned off from the existing block grant. Administration would probably need five percent of this. The phrase 'as soon as possible' probably means a launch date between April 1999 and October 2000, as a decision is unlikely to take place before the government's comprehensive spending review and primary legislation will be required.

If this proposal is accepted, the general issue of utility will be pivotal, as will identifying beneficiaries of research in a persuasive way. Beneficiaries will be of two types: direct (the academic community itself, museums, libraries, galleries and archives), and indirect. Funding schemes can be responsive or directive. Although there are some in the humanities community who will be resistant to the latter, the HRB already runs some directive schemes and public accountability will require that some of the funding is used in this way.

Directed programmes might include inter-institutional collaboration unconstrained by research fields; the development of the innovative use of IT in the arts and humanities; the promotion of studies of an area of emerging diplomatic or commercial interest; the maintenance of minority subjects; the development of large-scale scholarly reference works; and programmes jointly funded with other research councils. For the humanities, a strategic balance with 70 percent responsive and 30 percent directive modes of funding would be appropriate. This may not be the case for the arts.

Arts and humanities research now require the level of management and direction that a Research Council would impart

John Laver ended by referring to Ronald Barnett's report to the Dearing Committee. This pointed out that the focus on science and technology research downplays the rôle of the arts and humanities in the wider world, and that arts and humanities research is becoming more widespread and systematic through the use of computers and teams of researchers. 'It now requires' concluded Barnett, 'the level of management and direction that a Research Council would impart.'

➤ Concern was raised at the suggestion that the Dearing Committee had undervalued the intrinsic benefits of research in the humanities, and more generally the contribution of higher education to the nation's spiritual, moral and social well being. The humanities could contribute to an understanding of many of the challenges which face society — for example, our changing sexual mores and its effect on family structure and social cohesion.

The small amounts which the HRB currently dispenses for research are typically for one year and the recipient is usually a lone scholar without provision for support staff, whose prime

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resource was the archive, library or museum. The additional funds which are sought would enable longer and more ambitious projects, some of them interdisciplinary, and would provide cost-effective support.

Was there a basic difference between scientific and humanities research, creativity in the sense of discovery being a keynote of the former, but not of the latter? Creativity is central to the arts but the HRB had been obliged to restrict funding to historical, theoretical and analytical work and, for example, rejected funding requests from composers. A new research board with adequate funding might make it possible to relax this hard edged division and be more receptive to funding requests from the creative arts.

7 The universities' rôle in national competitiveness

Strong links between the science base and industry, **Linda Magee** explained, facilitate greater commercial returns.

While the UK is a creative society, we do not capitalise on the research and discoveries of academics to maximise the payback to the nation. Just one example is penicillin, a British discovery which was developed and marketed in the USA. Universities and industry need to work more closely together, so new ideas can be made into products and services with commercial value. Networks, incubators and science parks are important for bringing institutions closer together, and universities need to use technology more fully to disseminate information on research. It is also necessary to bring scientific and financial sectors together to promote small technology firms.

Universities contribute to competitiveness and wealth creation by:

- ***extending basic knowledge***. Basic academic research must be seen as the source of exploitable ideas and new technology. The Technology Foresight Exercise, in particular, tries to identify technology that should be supported by university and industry partnerships, although it is not always easy to determine which research will be profitable.
- ***education***. While higher education fosters the work of intelligent, creative research students in the development of new ideas, it also supplies highly trained individuals with technical and research skills who can adapt to the business environment.
- ***identifying innovative applications of science and technology***. Universities can explore the potential application of research, while technology can be used to audit and keep industry informed of research being carried out.
- ***technology transfer***. This may occur through individuals who have studied courses in specialised niche areas, and who go on to work in industry, but also maintain links with research groups. Alternatively, technological transfer comes about through the dissemination of intellectual property: patents, designs, and more general 'know-how'. The transfer of technological innovation often comes about by the licensing of patents, or the establishment of spin-out companies.

The contribution of the higher education sector to the successful management of companies and the national economy needs to be recognised and fostered. As the Dearing Report suggests, learning should be increasingly responsive to employment needs and include the development of general skills, while higher education also makes an important contribution to basic, strategic and applied research. Although British companies are generally regarded as having employees with a high level of skill and expertise in technology, there appears to be a weakness in management and strategic skills. Companies are not managed so as to foster innovation and entrepreneurship. One possible reason for this is that British companies are generally managed by accountants and financiers. A survey of 700 companies, conducted in 1990 by the University of Warwick, found that companies run by people with scientific or technological qualifications do better than those run by accountants and financiers.

There needs to be greater acceptance that risk-taking is a means of discovery and innovation

In order for companies to nurture a culture of innovation there needs to be greater acceptance that risk-taking is a means of discovery and innovation. In Europe considerable financial and career risks sometimes overwhelm creative individuals, while in the US there is greater acceptance of failure as part of the process of innovation. It is important for companies to provide support for individuals pursuing risky new paths. Company managers may also recognise the value of having visionaries working together with implementers, the researcher with the civil servant.

What is the nature of technological transfer between universities and industry? In 1994–95 it was estimated that over 80 percent of universities in the UK collaborate with industry. Universities have created more than 46 companies to commercialise research and technology, over 25 percent of University staff receive their principal source of salary from UK industry, nearly 6 percent of students receive their funding from UK industry and there is £145.7 million UK industry research income. Universities in Britain are already contributing significantly to wealth creation and industry is playing a considerable part in that process — but we still do not match up to the US.

In the biotechnology sector, companies are a fast growing source of employment and wealth creation. However, biotechnological research requires high specification laboratories and facilities conforming to stringent regulatory requirements, they often have a long product development stage, they require significant funding before there are financial returns and they have to negotiate onerous and costly regulatory and patent protection procedures. In this sector the UK has 221 companies with a revenue of £702 million, which is expected to double in the next year. A 1996 report found that 80 percent of UK companies wished to forge alliances with academia.

However there are problems. While there is an acceleration in discovery in bioscience, there is a funding gap between government and charity sources and what is attractive to industry and venture capitalists. The result is that either the technology is lost, or an early licence deal is struck which is unsatisfactory to both parties.

One way of overcoming the problems facing biotechnology start-up companies is the formation of a biotechnology incubator, clustered around a higher education research centre. The Manchester Biosciences Incubator was launched in February 1997 and has received funding from the University of Manchester, the EU and private investors. Its prime objective is to develop new biotechnology businesses by being in close contact with the science base and the clinical research community, provide state-of-the-art laboratories and facilities, provide professional business management and commercial services, and give the

support for inventor academics to risk failure in the process of exploring new ideas.

Apart from offering long-term financial gains, the Manchester Biosciences Incubator gives the University community opportunities for interaction with industrial scientists and enhancement of the scientific community, collaborative research, raised awareness of commercial development processes, the ability to see new ideas and technologies through to the later stage of development, and student placement in companies.

In conclusion, it is encouraging to note that several reports into Higher Education, including the Dearing Report and a report by the Technology Foresight Panel, have recognised the importance of addressing the quality, appropriateness and resourcing of technology transfer and exploitation activities in universities; the development of individuals with both technical and commercial skills; overcoming cultural and attitudinal barriers to effective partnership between academia and business; and the development of environments such as innovation centres, incubators or regional technology clubs to bring academia and industry together.

➤ It was suggested that it may be unfair to accuse British academics of lacking entrepreneurial abilities. Perhaps the problem is not with academics themselves, but with the capital structure and regulation of resources. While in the UK money is generally invested conservatively, usually where there is a likely financial return, in the US money may be put into research with little expectation of immediate financial gain. Many British academics are unable to get funding for ideas which would be supported in the US because American universities have richer alumni and greater resources to draw on. Investors in the UK are accustomed to funding according to output, and they must be encouraged to shift support to research in its earliest stages.

It is important to note there are often tensions within universities between those science or humanities academics who regard other departments and areas of research as being entirely marginal. Yet there are some important instances where the sciences and the humanities have worked together, one example being the use of art in medicine; the reconstruction of mummies' heads has lead to techniques that assist the police in forensic reconstruction. Having artists and humanities academics work together with scientific researchers is a way of engaging the general public in research, and contact between science academics and humanities researchers can also engender the culture of university departments.

Universities are the conscience of the nation, and house the people who will speak truth to power

In considering the universities' rôle in national competitiveness it is helpful to ask the question — what can only universities do? What is their unique function? While there are venture capitalists prepared to develop research in companies, and teaching may be presented through new technology, it seems that the unique functions of universities are to provide the certification of achievement, and to preserve a safe place for free, independent intellectual enquiry; universities are the conscience of the nation, and house the people who will speak truth to power. Everything else is in a sense second order. Thus for universities to maintain their rôle as an accrediting body it must continue to teach all kinds of things. If the university is to remain a safe place for intellectual enquiry it must maintain its essential autonomy and for this the university needs its own sources of money that do not come from government or from industry. Universities need to maintain a measure of financial independence if they are to preserve their dissenting rôle.

8 What are universities for?

As Chairman of the Committee of Vice-Chancellors and Principals (CVCP), **Martin Harris** believes in the value of a diverse higher education sector and the multi-faceted nature of the universities themselves. The diversity is to be celebrated because it ensures that the higher education sector meets the nation's needs for both the development of knowledge, and for education and training.

A diverse higher education sector ensures the nation's needs for both the development of knowledge, and for education and training are met

Despite the diversity, all universities face similar challenges:

- They work in an increasingly competitive environment. While there are some benefits from competition between universities themselves, such as the heightened awareness of the need for quality in teaching, research and services, there are also disadvantages, as there is likely to be a non-cost effective use of resources such as libraries, expensive facilities, and specialist teachers. The CVCP is committed to achieving a more collaborative approach among institutions.
- On the other hand, universities are facing increasing external competition from the private sector, nationally and internationally, from industry itself, from universities overseas and also because of the increasing demand for distance learning. For this reason, universities need to become more service orientated — in both their research and their teaching activities.
- In this competitive environment, with its strong focus on service, partnership between universities and stake holders is imperative; partnerships help ensure that quality and value for money are combined. The CVCP's agenda for action following the Dearing Report builds on the key Dearing concept of a general compact between key stakeholders, or, more specifically, between two or more institutions, for example to achieve better marketing overseas, the sharing of expensive equipment and the maximising of strengths.

University research is a crucial national asset; it contributes to economic growth at local and regional levels, and it advances knowledge on vital public concerns — especially health, education and the environment. It also helps the nation to remain competitive in global markets, and well-funded research must be an integral part of any compact between the university sector, government and society at large if Britain's international reputation for excellence is to be maintained.

Many difficult issues relating to the funding of research have yet to be addressed. Investment in university equipment and infrastructure, which are both essential to major research centres, has been inadequate. The shortfall in funding means many companies are taking their research and development abroad, with the consequential job losses and other adverse social effects. Universities are unable to afford advanced equipment

and laboratories, so it is difficult for them to give students the up-to-date knowledge and expertise they will need for work in large, well resourced companies. It is the CVCP's opinion that the £110 million estimated by Dearing as being needed to meet the full indirect cost of research projects is too low, although the CVCP does support the Dearing recommendation that programmes funded by the research councils should meet the full indirect costs, including the costs of premises and central computing, through the provision of additional resources.

Humanities research is of importance because some key challenges in science arise at the interface between science and technology and our social structures. To underpin and support the advancement of scientific and technological research there is a strong case for understanding our society and public attitudes to the possible impact of new science and technology. Philosophy and theology provide an insight into the ethical implications of pharmaceutical and genetic engineering, and to the development of economic and business strategy; law departments are at the centre of discussions of justice and human rights; linguistics is central to the development of the intelligent information systems that are crucial to supporting the information society; while the creative and performing arts are crucial to the multi-million pound entertainment industry.

Apart from research, universities play a major rôle in fostering life-long learning, and thus the development of a 'learning' society. There is a growing recognition that people with skills and initiative are needed at every level of an organisation, and there must be the opportunity for an employee's skills to be updated regularly. Universities offer foundation courses, non-award-bearing continuing education, sub-degree qualifications, degree and postgraduate qualifications. No other part of the education sector provides such breadth or diversity of courses.

Humanities research is of importance because some key challenges in science arise at the interface between science and technology and our social structures

Universities may allow for the expansion and widening of participation in higher education. The sector has already grown dramatically; in 1985 one in seven school-leavers went into higher education, today it is one in three. Yet we need to expand further to keep up with competitors in North America and the Far East who have a higher proportion of young people in higher education. The CVCP supports partnerships between universities and further education colleges so as to achieve Tony Blair's target of a 10 percent increase — 500,000 extra students — in higher and further education by the year 2002. The CVCP also supports initiatives to encourage and reward universities which take students from less well-off families and under-represented social and ethnic groups.

The planned contribution to Higher Education via tuition fees has given CVCP a basis for going forward, and it looks to the medium term with qualified optimism. However two political hurdles still need to be negotiated.

- Universities and students must get the full benefits of the new funding system, in particular the switch from grants to loans to meet living costs. To the CVCP, current accounting rules, which treat loans in the same way as grants, seem to be arbitrary and limiting. David Blunket has stated that he is battling with the Treasury for a change in the public sector accounting rules. It is estimated that this would release an extra £1 billion per annum for higher education.
- Universities are facing a short-term funding crisis which threatens to damage the long-term vision. While the Government found a much needed £165 million for higher education in England in 1998-99, this money simply delays further deterioration in a system buckling under the strain of years of under-funding. The picture for 1999-2000 is bleak; universities face cuts of about 4.5 percent while Dearing estimates that the minimum needed to deliver on access, life-long learning and expansion is an extra £565 million.

Foreign students have become an increasingly important source of revenue and competition in the international higher education market is fierce. Many institutions are exploiting such initiatives as distance learning modules, franchising to overseas partners, links and partnerships with institutions from what in other respects are competitor countries and, on a small scale, seeking to set up campuses abroad.

Clearly, universities make a vital impact on the UK economy. The higher education sector has an international balance of trade surplus of £1.8 billion. By contrast, the UK economy as a whole has a balance of trade deficit of £5.5 billion. The higher education sector has an annual revenue of £11.3 billion, and generates economic activity worth £31.76 billion. In addition, universities directly employ 318,000 people or 1.2 percent of the total UK workforce. As the exploitation of new ideas is the key to competitiveness for all companies, it is vital that there is a highly-educated work force, with life-long learning opportunities, and a highly educated research base. Through partnership with employers, other educators and the government, universities will continue to foster economic growth. Acting alone they will inevitably achieve less.

➤ It was suggested that while Martin Harris had emphasised the importance of collaboration between universities, in reality combining courses and research programmes is difficult to achieve, and benefits are not necessarily forthcoming. In reply it was noted that successful collaboration is occurring, just one example is the four university libraries in Manchester which have successfully arranged to have shared access. Certainly it is often difficult for academics and administrators to agree to collaboration when the process is time-consuming and the benefits are doubtful. There is a need for external incentives to encourage universities to collaborate, but this certainly does not mean a return to the central planning of the higher education sector.

The Dearing Report noted the importance of continual professional development for lecturers and the increased use of Information Technology to support teaching and learning, but how much impact is this likely to have? Martin Harris suggested that it will soon become mandatory for academics entering the profession to first undergo training, and it is even possible that academics who have been teaching for a long period of time will be required to undertake professional development programmes.

In this conference's consideration of the question 'What are universities for?' it is worth endorsing the aims of St Catharine's, and the vision of its founder, Amy Buller. She believed that universities have a vital rôle in teaching students to use their critical judgements on society, and to provide an independent environment where the most important issues can be discussed freely.

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